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THE STENINE BEETLES OF THAILAND

(COLEOPTERA STAPHYLINIDAE)

INTRODUCTION

The subfamily Steninae, including only two genera, *Stenus* Latreille, with over 1600 described species, and *Dianous* Leach with about 100 species, is world-wide in distribution, but none had so far been recorded from Thailand **. This is all the more surprising in that Thailand has for many years, and especially since the recent influx of tourists, been relatively easy of access, and the faunas of some other countries in that area such as Burma and Vietnam are known to be rich in Steninae.

The author, who frequently travels to Thailand and other Asian countries in the course of his work, has made a special search for these beetles, and has assembled, in what amounts to only a few days' collecting, 283 exx. belonging to thirty three different taxa. Another 10 specimens or records were communicated to me by Dr. PUTHZ, and the study of this material is the subject of this paper.

The Holotypes of all the new species described in this paper have been donated to the Museo Civico di Storia Naturale « G. Doria » Genoa. The remainder of the material, including Paratypes, has been divided between the collections of that same museum and those of the British Museum of Natural History, V. Puthz, and the author.

Measurements of insect's body length are given in mm. Smaller measurements were made at x 80 magnification using an eye-piece micrometer, so each unit of measurement equals 0.025 mm.

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** At the time of going to press several papers by PUTHZ have appeared in which records from Thailand are mentioned. All these refer to material described in this paper, communicated by the author in the course of sustained correspondence regarding their respective work on Steninae.

ACKNOWLEDGEMENTS

The drawings in this article were made with equipment in the B.M.N.H. I must therefore thank once again the staff of the Coleoptera Department, who also allowed me access to the museum collections. I am deeply indebted to Dr. V. PUTHZ, of the Max-Planck Institute in Schlitz, who has given me invaluable help in the preparation of this paper, by identifying some species, by giving me much advice, and by generously informing me in advance of publication of his own work on this subject. I must thank him also for providing some of the unpublished data collected by others which I have included in this paper.

SHORT KEY TO THE STENINAE AT PRESENT KNOWN FROM THAILAND

It has recently been shown (PUTHZ, 1981) that the characters traditionally used to separate *Stenus* from *Dianous* (relative size of eyes and terminal brushes) do not apply to *Dianous* of the *nigrovirens* group (group I, PUTHZ 1981), which were formerly thought to belong to *Stenus*, and that the only constant generic character lies in the structure of the eulabium. As this is difficult to examine, especially in dried material, both genera are here treated together in the same key. It may be added that all the *Dianous* species from Thailand have a blue or greenish metallic reflex, not shown by any of the Thai *Stenus*, which are black with at most a leaden or dull bronze reflex.

Species in brackets are not recorded from Thailand, but in the author's opinion almost certainly occur there.

- 1 (30) Abdomen normally margined.
- 2 (5) 4th tarsal segments bilobed.
- 3 (4) Each elytron with a red or yellow spot (*Parastenus* spp.)
- 4 (3) Elytra immaculate; 4 mm . . . *Stenus kempfi* Bnh.
- 5 (2) 4th tarsal segments simple, or at most slightly emarginate, not bilobed.
- 6 (23) Vertex of head raised on median axis, often bisulcate.
- 7 (8) Each elytron with a round yellow spot; black, with a strong blue or purple reflex; 5.5-6.5 mm *Dianous luteolunatus* Puthz
- 8 (7) Elytra immaculate.
- 9 (12) Body with a strong blue, purple, or greenish reflex.
- 10 (11) Larger (ca. 6.5 mm); punctuation of elytra very fine and dense; punctuation of pronotum coarser, and sparse; aedeagus fig. 1A *D. srivichaii* n. sp.

- 11 (10) Smaller (3.7-4.1 mm); punctuation of forebody rugose, confluent, forming vorticose rugae on elytra; aedeagus fig. 2A *D. Karen* n. sp.
- 12 (9) Body black, or with a faint bronze reflex, never blue or green
- 13 (16) Basal tergites of abdomen without a median keel.
- 14 (15) Legs testaceous; basal tergites of abdomen crenulate; 3.5-4.5 mm *S. comes* Fv.
- 15 (14) Legs entirely black; basal tergites of abdomen with 4 keels (*S. melanarius annamita* Mots.)
- 16 (13) Basal tergites of abdomen with a median keel.
- 17 (18) Body covered with long, dense pubescence; aedeagus fig. 7; 4.1-4.3 mm *S. siamensis* n. sp.
- 18 (17) Pubescence short and sparse; very small species.
- 19 (20) Punctuation of pronotum confluent, forming transverse rugae; 3-3.5 mm; aedeagus fig. 8 . . . *S. rugicollis* Kr.
- 20 (19) Punctuation of pronotum coarse but simple, not forming transverse rugae.
- 21 (22) Pubescence yellowish; vertex of head entirely punctate; 2.2-3 mm; aedeagus fig. 9 *S. beelsoni* Cam.
- 22 (21) Pubescence whitish; vertex of head with smooth impunctate median axis; 2-2.5 mm; aedeagus fig. 10 *S. mon* n. sp.
- 23 (6) Median axis of vertex depressed, sometimes concave, sometimes with raised lateral portions, never bisulcate.
- 24 (25) Legs entirely black; body and legs with a blue, purple, or greenish reflex; 3.8-4.2 mm; aedeagus fig. 6A *D. meo* n. sp.
- 25 (24) Legs partly pale.
- 26 (27) Larger (4.5-5.7 mm); fore-body with a dark bronze or greenish reflex; aedeagus fig. 4A . . . *D. yao* Rougemont
- 27 (26) Smaller (4.3-5 mm); forebody with a brighter blue or green reflex.
- 28 (29) Forebody with a greenish reflex; abdomen more coarsely punctate; aedeagus fig. 3 . . . *D. tonkinensis* Puthz
- 29 (28) Forebody with a blue reflex; abdomen more finely punctate; aedeagus fig. 5A *D. lahu* n. sp.

- 30 (1) Abdomen very finely margined throughout, or only 3rd and last segments finely margined.
- 31 (38) Abdomen finely margined throughout.
- 32 (37) Each elytron with a yellow spot; larger species (5.5-8 mm).
- 33 (34) Elytral spots securiform, reaching posterior margins of elytra *S. circumflexus* Fv.
- 34 (33) Elytral spots round, not reaching posterior margins of elytra.
- 35 (36) Smaller (5-6 mm); 9th sternite or valvifers denticulate outside apico-lateral teeth; eyes enormous; surface of pronotum and elytra very uneven, shiny . . . *S. feae* Fv.
- 36 (35) Larger (7-8 mm); 9th sternite or valvifers without lateral denticulation; eyes large; surface of pronotum and elytra less uneven, duller *S. gestroi grandiculus* Bck.
- 37 (32) Elytra immaculate; smaller species (ca. 4 mm) *S. sp. cf. meracus* Bck.
- 38 (31) Only 3rd and last abdominal segments finely margined.
- 39 (40) 4th tarsal segments simple; 3.6-3.9 mm; aedeagus fig. 19 *S. articulipenis* n. sp.
- 40 (39) 4th tarsal segments bilobed (*Hypstenus*).
- 41 (48) Abdomen bicolorous.
- 42 (43) Thorax entirely black; elytra black with a large orange spot on each; abdominal segments 5-6 orange, the rest black; 6-7 mm; aedeagus fig. 15 *S. pulchrior* Puthz
- 43 (42) Thorax, elytra and abdomen otherwise coloured.
- 44 (47) Thorax and abdominal segments 3-6 entirely reddish-yellow.
- 45 (46) Posterior margin of 8th tergite with a triangular emargination *S. flavidulus paederinus* Champ.
- 46 (45) Posterior margin of 8th tergite imperceptibly concave, not emarginate (*S. oedichiroides* Rougemont)
- 47 (44) Dorsal surfaces of pronotum and elytra, and abdominal tergites pitchy-black; ventral pieces, except sternites 7-9, entirely fulvous; aedeagus fig. 16A . . . *S. fulviventrís* n. sp.
- 48 (41) Abdomen entirely black.
- 49 (54) Elytra bicolorous.

- 50 (51) Elytral spots small, sometimes obsolescent, their diameter not greater than length of 1st metatarsal segment *S. pustulatus* Bnh.
- 51 (50) Elytral spots large, covering most of disc.
- 52 (53) Larger (6.5-7 mm); punctuation coarser; aedeagus fig. 12 *S. amoenus* Bck.
- 53 (52) Smaller (4.5-5 mm); punctuation finer; aedeagus fig. 13A *S. alamoenus* n. sp.
- 54 (49) Elytra entirely black.
- 55 (62) 9th sternite or valvifers with a prominent apico-lateral tooth.
- 56 (57) Smaller (ca. 3.5 mm); head much narrower than elytra, with five shiny plaques; abdomen strongly tapered *S. piliferus* Mots.
- 57 (56) Larger (4.5-6 mm); head scarcely narrower than elytra, without shiny plaques; abdomen cylindrical, hardly tapered before 7th segment.
- 58 (59) Smaller (ca. 4.5 mm); punctuation sparser; abdomen less thickly pubescent (*S. basicornis* Kr.)
- 59 (58) Larger (5-6 mm); punctuation denser; abdominal pubescence long and recumbant.
- 60 (61) Aedeagus fig. 17 *S. bispinus* Mots.
- 61 (60) Aedeagus fig. 18 (*S. n.sp.* Puthz)
- 62 (55) 9th sternite or valvifers without a prominent apicolateral tooth.
- 63 (66) 10th tergite emarginated apically, with prominent apico-lateral angles, or teeth.
- 64 (65) 1st antennal segment black; apicolateral angles of 10th tergite produced into prominent teeth *S. cursorius* Bck.
- 65 (64) 1st antennal segment rufous; apicolateral angles of 10th tergite prominent, acute, but not produced into teeth (*S. cribellatus* Mots.)
- 66 (63) 10th tergite rounded apically, not emarginate and without prominent apicolateral angles.

- 67 (68) 1st antennal segment black; legs dark, with basal halves of femora rufous; pronotum and elytra very unevenly punctate, with irregular shiny plaques; 5-6 mm; aedeagus fig. 11A
 *S. puthzianus* n. sp.
- 68 (67) 1st antennal segments and legs entirely pale; pronotum and elytra regularly punctate, without shiny plaques.
- 69 (70) Larger (5.5-6 mm) slenderer species, with longer appendages; 1st metatarsal segment as long as the three following together *S. angusticollis* Epp.
- 70 (69) Smaller (4.5-5 mm), more robustly built species; 1st metatarsal segment shorter than three following together.
- 71 (72) Apex of median lobe with a ventral keel and barb . . .
 *S. wasmanni* Fv.
- 72 (71) Apex of median lobe without ventral keel or barb . . .
 (*S. gastralis* Fv.)

***Dianous srivichaii* n. sp.**

Dianous spec. 7 Rougemont Puthz 1981, Ent. Abh. St. Mus. Tierk. Dresden, 44, 122.

This new species belongs to that group of *Dianous* which are very finely and densely punctate, have fascia of pubescence on the elytra, and simple fourth tarsal segments. It is close to *D. puberulus* L. Bck. from Burma.

Length: 6-6.5 mm. Fully winged. Head, elytra and legs cyaneous (dark blue); pronotum and abdomen dark metallic green; palpi and antennae fuscous, the antennal club somewhat lightened. Dorsal surface, except pronotum, very finely and densely punctate; punctuation of pronotum coarse, shallow and sparse.

Head as broad as elytra between humeral angles, narrower than these at their greatest breadth; punctuation and pubescence very fine and dense, the pubescence short on vertex, long on clypeus, where punctuation is coarser and sparser; frons with two shallow slightly elongate depressions on either side of broadly raised median part. Antennae when reflexed overlap the base of pronotum by last three segments; antennal segments: I:7; II:5; III:14.5; IV:7; V:7; VI:7; VII:7; VIII:5; IX:5; X:5 (width: 3); XI:6.

Pronotum slightly transverse (30:33), broadest at anterior third, with sides sinuate posteriorly; disc with an anterior marginal depression;



Figs. 1: *Dianous srivichaii* n. sp. - A: aedeagus, ventral view; B: male 9th sternite; D: male 8th sternite. 2: *Dianous karen* n. sp. from Mae Sa Cascades - A: aedeagus, ventral view with inner sac fully everted; a: ibid., dorsal view, with inner sac partially everted; B: male 9th sternite.

base broadly depressed, the depression bifurcating towards anterior angles; anterior portion of disc convexely rounded, with two bosses near anterior angles, and two others outside the basal depressions; entire surface with scattered, coarse, shallow punctures, these being deeper and denser in basal depressions.

Elytra slightly elongate (55:50); length of suture: 49; evenly, but only slightly narrowed anteriorly and posteriorly, their broadest point about 1/3rd from posterior margin, whole surface very finely, densely and evenly punctate and pubescent, the pubescence very short generally, but forming silvery fascia in posterior half near the suture, and, to a lesser extent, just behind anterior angles; surface of disc fairly even, with a longitudinal depression extending from humeral angle to nearly 1/2, and a smaller, round depression beneath posterior fascia.

Abdomen strongly bordered to sixth border. Whole surface of tergites densely and finely punctate and pubescent; tergite VIII more coarsely and very sparsely pubescent; tergite IX impunctate; tergite X densely setose apically. Legs finely pubescent, the pubescence longer and denser on inner, apical half of tibia (male secondary sex character?); posterior tarsi more than half the length of tibia (30:50), with first segment longer than the last; tarsal segments: I:12; II:4.5; III:4; IV:3; V:10; fourth segment simple.

Male: sternite VII not excavate apically, but broadly covered with long, dense pubescence; sternite VIII (fig. 1B) shallowly emarginate; sternite IX with broad apico-lateral processes and moderate brushes; aedeagus: fig. 1A.

Female: unknown.

♂ Holotype: Doi Suthep, Chiang Mai Prov., alt. 900 m, by shaded torrent, in primary forest, 6.III.1979, G. de Rougemont; 2 ♂♂ Paratypes: Vietnam: Mountains 50 Km. N.W. of Thai Ngien, 300 m, 8.III.1963, Kabakov.

This handsome new species was searched for unsuccessfully on several subsequent visits to the same locality on Doi Suthep.

***Dianous luteolunatus* Puthz**

Dianous luteonotatus Puthz, 1980, Reichenbachia 18, 1, 3.

1 ♂, 2 ♀♀: Mae Sa Cascades, Chiang Mai Prov., on a rock face covered with wet dead leaves and slime mould, in spray zone of cascade,

27.XII.1979, G. de Rougemont; 4 ♂♂, 2 ♀♀: *ibid.*, 14.VIII.1980, G. de Rougemont.

This distinctive metallic blue species with yellow elytral spots was recently described from a single male among the material collected in Vietnam by G. Kabakov. The habitat in which the Thai series was taken is an unusual one, being totally exposed to sunlight, and these were the only pterigote insects found living there. The *Dianous* exx. remained completely immobile in their habitat, and only moved very sluggishly after capture.

***Dianous karen* n. sp.**

The single ex. of this new species is indistinguishable from *D. vietnamensis* Puthz (1980, Philippia, 4, 3, 234), according to PUTHZ, who was unable to examine the aedeagus (lost in transit). This however differs considerably from the figure of that of *D. vietnamensis* given by the author, so *D. karen* is hereby described as a new species.

Length 3.9 mm. Upper surface rather dull, coarsely and rugosely punctate, the punctuation forming vorticose rugae on pronotum and elytra. Black, with a metallic blue reflex on clypeus, frons, lateral portions of vertex, sides of pronotum and of elytra; legs black with a metallic blue or purple reflex; palpi and antennae pitchy-brown, with antennal club much lighter. Pubescence of forebody short, obsolete on dorsal surface, dense on ventral surface.

Head much narrower than ample elytra between humeral angles (33:38); vertex broad (average distance between eyes: 20), with median axis raised between two deep, narrow sulci, narrowly impunctate on median line; lateral portions of vertex, between sulci and eyes, raised above inner margins of eyes; punctuation of vertex coarse, each puncture about equal to the diameter of base of third antennal segment, not confluent except in the longitudinal depressions; punctuation sparser, but not finer, on frons and clypeus, both of which carry long golden pubescence. Antennae, when reflexed, overlap the hind margin of pronotum by nearly the last two segments; penultimate segment broad (3:4), the terminal segment more elongate (3:5).

Pronotum as long as broad (26), its greatest breadth situated about 2/5ths from anterior border, irregularly rounded anteriorly, broadly

sinuate in posterior half; surface of disc irregular, with a transverse depression just behind anterior margin, and two obliquely divergent, shallow depressions in posterior third. Punctuation of disc about equal in coarseness to that of head, but forming a central vorticose whorle of rugae.

Elytra ample, quadrate, with prominent and broad humeral angles; maximum length of elytra: 41; maximum breadth: 42; distance between humeral angles: 39; length of suture: 36. The rugose punctuation forms a pattern on each elytron comparable to the roots of a tree, extending from the entire length of the suture, and flowing into a central « trunk » situated a little behind the middle; posterior to this « trunk » situated a little behind the middle; posterior to this « trunk » or main stream of rugae, about equidistantly from the sutural and posterior margins, the rugae resolve into a vorticose whorle, on the outside of which the integument is suffused with a metallic blue reflex.

The abdomen is relatively short and acutely tapered: breadth of third segment (measured from lateral ridges of paratergites): 30; breadth of seventh segment: 19. Tergites III-VII uniformly punctate, the punctuation fine and dense. Paratergites broader than 1st antennal segment (paratergite IV: 2.5), densely and finely punctate, the punctuation marginally coarser than that of tergites; punctuation of tergite VIII coarser and sparser, setose; tergite IX impunctate; tergite X with a few scattered setigerous pores, regularly rounded and slightly depressed on posterior margin. Both surfaces of abdomen densely pubescent, the pubescence longer on sternites.

Legs robust; tarsi simple, with 4th segments imperceptibly broadened apically; length of metatibia: 33; length of tarsi: 27; tarsal segments: I:2; II:4; III:3; IV:2; V:7.

Male: sternite VII slightly excavate and depressed posteriorly, with a patch of denser pubescence; sternite VIII: (damaged); sternite IX: scarcely emarginate, with a broad row of acute denticles (fig. 2B); terminal brushes as long as sternite; aedeagus (fig. 2A) with apex of median lobe broadly and densely pilose; parameres with very long, stout setae.

♂ Holotype: Mae Sa Cascades, Chiang Mai Prov., by splashing plants growing in fissures of rock face of river bed, 27.XII.1979, G. de Rougemont.

Of the other *Dianous* spp. now known from Thailand, *S. karen* n. sp. most closely resembles *D. meo* n. sp. in size, colour, and sculpturation. Its affiliation to a different phyletic group is shown by the conformation of the vertex of the head (not depressed on median axis), and it may further be distinguished by its more acutely tapering abdomen and slightly more robust build. *D. vietnamensis* Puthz was recently described from Vietnam.

***Dianous tonkinensis* (Puthz)**

Stenus tonkinensis Puthz, 1968, Dtsch. Ent. Z., N.F. 15, 447.

Dianous tonkinensis Puthz, 1981, Ent. Abh. St. Mus. Tierk. Dresden, 44, 102.

1 ♀: Mae Sa Cascades, Chiang Mai Prov., running on dry rock surface near a seepage marsh near river bank, 19.X.1979, G. de Rougemont.

D. tonkinensis Puthz is known from Vietnam, Borneo, Celebes and Sumatra. The identity of the ex. from Thailand can only be definitely established by the discovery of males in the future.

***Dianous yao* Rougemont**

Dianous yao Rougemont 1981, Ann. Mus. Civ. Stor. Nat. Genova, 83, 330.

Dianous spec. 5 Rougemont Puthz, 1981, Ent. Abh. St. Mus. Tierk. Dresden, 44, 105, 108.

5 ♂♂, 5 ♀♀: Doi Inthanon, Chiang Mai Prov., ca. 1300 m, on dry surface of boulders in a small stream, in primary forest, 26.XII.1979, G. de Rougemont.

This species was recently described from a series taken subsequently, and in similar conditions, in Shan State, in Burma. These new records confirm the species's originality.

***Dianous lahu* n. sp.**

This new species belongs to that group of *Dianous* (*nigrovirens* group formerly considered as *Stenus* spp., with relatively larger eyes, and frons depressed on its median axis. It sembles *D. nagamontium* Puthz (*assamensis* Cameron, 1930).

Length: 3.2-4.2 mm. Fore-body dark metallic blue; abdomen black with a bronze reflex; palpi dark testaceous, more or less heavily infuscate; antennae reddish brown; legs pale testaceous, broadly infus-

cate at knees, especially on femora. Punctuation of fore-body coarse, rugose, confluent on elytra.

Head broader than the (variable) elytra, even at their broadest point (32:31), with large eyes and broad frons (19); frons depressed on median axis, with lateral portions slightly swollen between median depression and rather broadly explanate borders with eyes. Punctuation coarse and dense, rugose on whole surface, the diameter of punctures equal to the distal section of third antennal segment, the interstices very narrow, but not forming confluent rugae. Antennae moderate, the fourth segment $\frac{4}{7}$ ths the length of the third, the two penultimate segments twice as long as broad, and pear-shaped.

Pronotum only slightly elongate (23:22), its surface irregular. Punctuation about as coarse and close as that of head, but rugose, becoming slightly, shortly confluent on parts of disc.

Elytra quadrate, broad at humeral angles (29), very little widened to posterior $\frac{1}{3}$ rd (31), and scarcely elongate (33); length of suture: 28. Punctuation confluent over a considerable part of the disc.

Abdomen scarcely narrowed towards apex before seventh segment. Punctuation of shiny basal depressions of tergites and sternites coarse and sparse, that of the posterior parts of tergites extremely fine and dense, of sternites fine and sparse. Paratergites broader than width of second antennal segment, finely and densely punctate. Tergite X shiny, coarsely setose on posterior margin, with a deep apico-median depression. Legs averagely long; metatibia: 30; metatarsi: 24; first tarsal segment as long as following three together.

Male: sternites III-VI without special characters; sternite VII with a sharply demarcated, elongate apico-median depression in which the punctuation and pubescence are somewhat denser; sternite VIII with a deep triangular excision extending to $\frac{2}{5}$ ths of its length; sternite IX: fig. 5B; aedeagus (fig. 5A) apex of median lobe without visible pilosity.

♂ Holotype: Doi Suthep, Chiang Mai Prov., alt. 900 m, on boulder in stream in primary forest, 25.XII.1979, G. de Rougemont; 2 ♀ Paratypes: ibid., by splashing base of masonry culvert, 22.X.1979, G. de Rougemont.

Dianous lahu fits into PUTHZ's new key to the unspotted *Dianous* of the world (1981) just after *D. nagamontium* Puthz from which it dif-

fers by its colour (dark green in the other species), its finer punctuation and rugae on pronotum and especially elytra, much deeper emargination of the male eighth sternite, and the aedeagus.

Dianous meo n. sp.

Dianous spec. 6 Rougemont Puthz, 1981, Ent. Abh. St. Mus. Tierk. Dresden, 44, 105.

This species belongs, like *D. lahu* n. sp., to the *nigrovirens* group. Its narrower head, dark legs, and confluent elytral punctuation make it comparable to the Bornean species *D. kinabalumontis* Puthz.

Black, fore-body with a strong cyaneous or purple reflex; reflex on abdomen faint, blueish on anterior segments, bronze on terminal half; palpi and antennae fuscous brown, legs pitchy black. Punctuation coarse, the rugae strongly confluent on pronotum and elytra; underside, abdomen and legs densely pubescent.

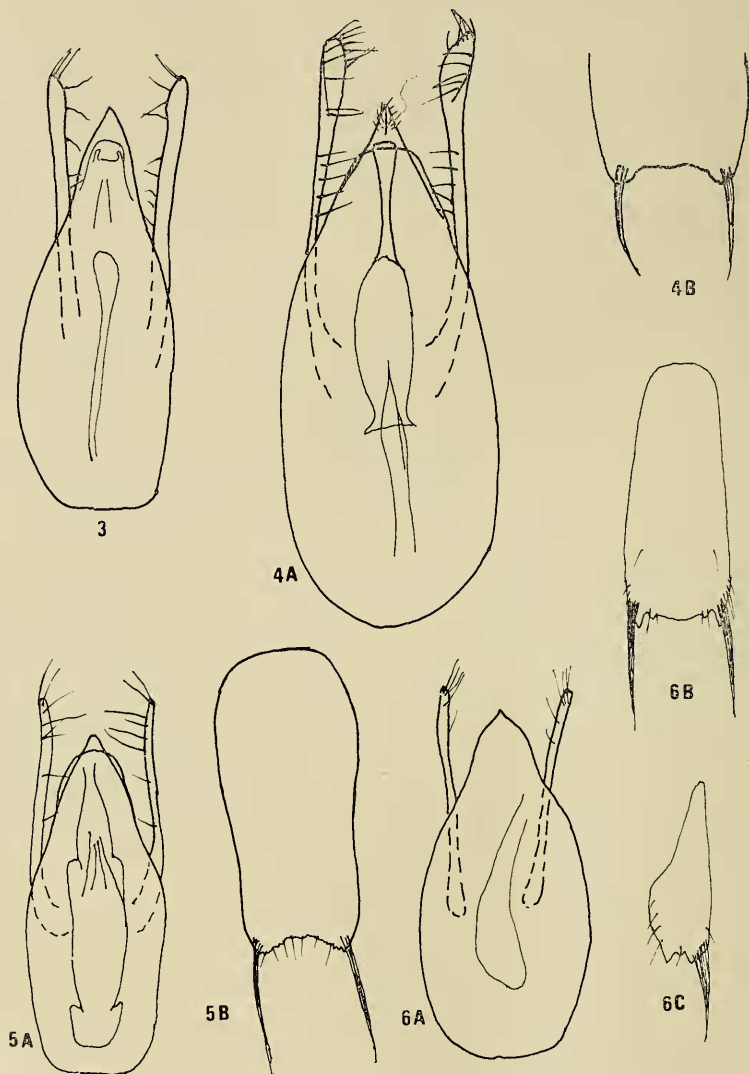
Head slightly narrower than elytra at their broadest point (31:34), with large eyes set wide apart (16); frons deeply depressed on median axis, the lateral portions slightly raised above the inner margins of the eyes. Punctuation coarse, the diameter of punctures equal to the basal section of third antennal segment, and relatively sparse: the flat interstices are equal to or greater than the diameter of punctures. Antennae moderately long, overlapping the posterior margin of the pronotum by more than the terminal segment; the fourth segment 4/5ths the length of third, the penultimate segments about as long as broad.

Pronotum no longer than broad (24), its greatest breadth before the middle, broadly rounded anteriorly and strongly sinuate in basal half. Surface uneven, with irregular depressions, the punctuation coarse. The very coarse rugae form a transverse narrowly elliptical vortex on disc, the outer rugae parallel and transverse.

Elytra parallel, with broad humeral angles, slightly elongate (37:35). Confluent punctuation similar to but marginally coarser than that of pronotum, the rugae transverse, perpendicular to the suture at middle, radiating obliquely towards sutural angles from outer-middle.

Abdomen moderately tapered: width of third segment: 26; sixth segment: 22; seventh segment: 19. Tergites shiny, finely and densely punctate, the punctures much smaller than eye facets. Paratergites broad, those of fourth segment much broader than the diameter of second antennal segment, finely and densely punctate and pubescent.

Tergite VII with an apical membranous fringe; tergite X shiny, rounded at apex, and depressed. Legs fairly long; length of metatibia: 34; length



Figs. 3: *Dianous tonkinensis* Puthz from Celebes, aedeagus, ventral view; 4: *Dianous yao* Rougemont from Doi Inthanon - A: aedeagus; B: apex of male 9th sternite; 5: *Dianous lahu* n. sp. - A: aedeagus; B: male 9th sternite; 6: *Dianous meo* n. sp. - A: aedeagus; B: male 9th sternite; C: female valvifer.

of metatarsi: 28; first metatarsal segment as long as the three following together.

Male: punctuation of sternite VII becoming very fine and dense on extreme apico-median part, but not depressed; sternite VIII with a shallow round emargination to one sixth of its length; sternite IX (fig. 6B) characteristic, with median part of apical border convexely rounded, and sharp apico-lateral teeth. Aedeagus: fig. 6A; the basal part of the median lobe may appear narrow when the exosclerite is collapsed.

Female: valvifer with an apico-lateral tooth commensurate with those of the male ninth sternite.

♂ Holotype, 2 ♂♂, 2 ♀♀ Paratypes: Doi Suthep, Chiang Mai Prov. on boulders in mid-stream of a small shaded torrent in primary forest, 18.X.1979; 2 ♂♂, 1 ♀ Paratypes: *ibid.*, 25.XII.1979; 11 ♂♂, 15 ♀♀ Paratypes: *ibid.*, 13.VIII.1980; 1 ♀: Mae Klang Waterfall, Doi Inthanon, Chiang Mai Prov., on rock face of pool, 26.XII.1979; 3 ♂♂, 3 ♀♀: *ibid.*, on mossy boulders in waterfall, 14.VIII.1980; 1 ♂, 2 ♀♀: Mae Sa Cascades, Chiang Mai Prov., on rock overhang by waterfall, 27.XII.1979; 4 ♂♂, 7 ♀♀: *ibid.*, 14.VIII.1980, all G. de Rougemont.

The records for this new species show that it is common and widespread, at least in this area, and it is one of the few stenines which is more abundant during the monsoon than in the dry season. It appears to be quite narrowly restricted to certain micro-habitats: The exx. collected in October and January on Doi Suthep were all taken on a single boulder, by visiting it at short intervals, while the many other similar boulders in the immediate vicinity were barren. *D. lahu* n. sp. was found a few yards away, in somewhat drier conditions, without the covering of fine moss affected by *D. meo* n. sp.

***Stenus* (s. str. & *Nestus*) *siamensis* n. sp.**

This new species belongs to a small group of Oriental species characterised by their small size, long and dense pubescence, and a median keel on the basal tergites of the abdomen. It most closely resembles *S. diffidens* Cam. (*S. hirsutus* Cam.).

Length: 4-4.3 mm.

Proportions of Holotype: width of head: 36; average distance between eyes: 17; length of antennae: 40; length of pronotum: 29; width of pronotum: 25; elytra between humeral angles: 29; maximum width

of elytra: 36; maximum length of elytra: 36; width of abdominal tergite III (measured from outer edges of paratergites): 28; width of tergite VII: 19; posterior tibia: 29; metatarsal segments: I:9; II:6; III:2.5; IV:2.5; V:3.5.

The insect is close enough to *S. diffidens* Cam. to fall into that species range of variability; compared with an ex. from Assam in the B.M.N.H., it differs by its greater size and somewhat denser punctuation of the abdominal tergites, but the aedeagus (fig. 7) resembles those of *S. sumbaensis* Scheerpeltz from the lesser Sunda Island and *S. duplo-punctatus* Bnh. from the Philippines in the knob shaped apex of the median lobe. It differs from *S. sumbaensis* by its much more finely punctured abdomen and by its proportionately broader head, with a more distinctly raised median portion and furrows. From *S. duplo-punctatus* it may be distinguished by its deeper and denser abdominal punctuation.

♂ Holotype, 1 ♀ Paratype, 1 ♀ ex.: Wang Takrai Park, Nakhon Nayok Prov., in vegetable refuse under plants in shaded stream bed, 31.III.1980, G. de Rougemont; 1 ♀: Doi Suthep, Chiang Mai Prov., by a stream in primary forest, 25.XII.1979, G. de Rougemont; 1 ♀: Keng So Pa Waterfall on r. Khek, Phitsanulok Prov., at roots of low growing plants on river bank, 23.XII.1979, G. de Rougemont.

Only one ♀ from the type locality is designated as Paratype, the other 3 ♀♀ differing in minute details of proportions from the type.

***Stenus* (s. str. & *Nestus*) *comes* Fv.**

Stenus comes Fauvel, 1895, Rev. d'Ent. XIV, 207.

Stenus comes Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 336.

Stenus comes Puthz, 1969, Bull. Inst. r. Sci. nat. Belg., 45, 9, 9 ff.

Stenus comes Puthz, 1980, Reichenbachia 18, 3, 31.

6 ♂♂, 9 ♀♀: Doi Inthanon, Chiang Mai Prov., ca. 1300 m., on dry boulders in a small stream, in primary forest, 26.XII.1979, G. de Rougemont.

This species was previously only known by the types, collected by L. Fea in Tenasserim (S. Burma) in 1887.

The present series was found in a « *Dianous* habitat », climbing rapidly on the exposed faces of large boulders in a torrent, with only a few scattered dry leaves for cover. This habitat, on a dry substrate,

but near water, is identical to those in which *Dianous yao* Rougemont were found only a few yards away, and in which *S. articulipenis* n. sp., described below, was found in a different locality.

***Stenus* (s. str. & *Nestus*) *rugicollis* Kr.**

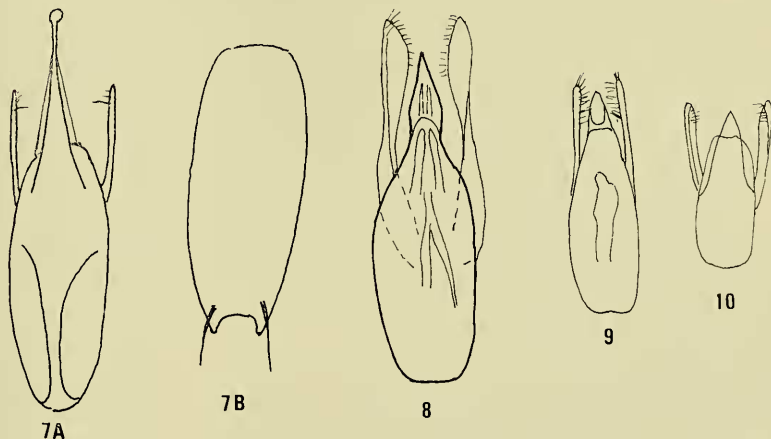
Stenus rugicollis Kraatz, 1859, Arch. Naturg. XXV, I, 162.

Stenus rugicollis Cameron, 1930, Faun. Brit., Ind., Col. Staph. I, 337.

Stenus rugicollis Puthz, 1980, Reichenbachia 18, 3, 39.

6 ♂♂, 9 ♀♀: River Kwae Noi, at Ban Soi Yok (N. 14° 27' E. 98° 51'), Kanchanaburi Prov., under dead leaves on mud river bank, 12.X.1979, G. de Rougemont; 2 ♀♀: River Kwang, 13 Km. N.E. of Doi Saket, Chiang Mai Prov., on mud river bank, 19.X.1979, G. de Rougemont; 4 ♀♀: Chiang Rai, under dead leaves shaded by shrubs on bank of R. Kok, 30.XII.1979, G. de Rougemont.

S. rugicollis was previously known from India and Burma. The male is described by PUTHZ (1966). It is curious that this species replaced the closely allied *S. mon* n. sp. found 7 months earlier the same patch of mud.



Figs. 7: *Stenus* sp. prope *diffidens* Cam. from Wang Takrai Park - A: aedeagus; B: male 9th sternite; 8: *Stenus rugicollis* Kr., aedeagus; 9: *Stenus beelsoni* Cam., aedeagus; 10: *Stenus mon* n. sp., aedeagus.

Stenus (s. str. & *Nestus*) **beesoni** Cam.

Stenus beesoni Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 346.

Stenus beesoni Puthz, 1968, Dtsch. Ent. Z., N.F. 15, 454.

Stenus beesoni Puthz, 1980, Reichenbachia 18, 3, 38.

Stenus beesoni Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 332.

1 ♀: Suai River, Chiang Rai Prov., on stones in bed of stream in jungle, 6.III.1979, G. de Rougemont.

S. beesoni was described from the Himalaya of N. India, and recently found in Burma.

Stenus (s. str. & *Nestus*) **mon** n. sp.

Stenus sp. Rougemont Puthz, 1980, Reichenbachia 18, 3, 38.

This new species belongs to the Oriental *rugicollis* group.

Black, moderately shining, coarsely and rugosely punctate. Pubescence short, yellowish. Palpi testaceous; antennae ferruginous with clubs infusate; legs testaceous, faintly and narrowly darkened at apices of femora. Length 2.5 mm.

Head broader than elytra at base, nearly as broad at their maximum width (23:24); frons broad (average distance between inner margins of eyes: 13), bisulcate, with the raised median portion shiny between a single row of punctures on inner sides of sulcae, punctuation of anterior and lateral portions coarse and rugose, the diameter of punctures nearly as great as that of second antennal segment. Antennae short, only reaching to half the length of pronotum when reflexed; antennal segments: I:2.5; II:2.5; III:2.5; IV:2; V:2; VI:1.5; VII:1; VIII:—1; IX:+1; X:1.5; XI:2; club distinct, with penultimate segment slightly transverse.

Pronotum slightly elongate (19:18), its greatest breadth about the middle, convexely rounded anteriorly, slightly sinuate posteriorly, the whole surface evenly rugosely punctate, the punctuation only slightly coarse than that of head.

Elytra transverse (21:24), parallel, scarcely narrowed at humeral angles; length of suture: 16. Surface uniformly rugosely punctate, the punctuation hardly coarser than that of pronotum.

Abdomen thickly margined, strongly and regularly narrowed towards apex; width of tergite III (measured from outer edge of paratergites): 20; width of apex of tergite VIII:8; tergites III-VII with

relatively coarse, shallow, and dense punctuation. Basal median keels distinct on third and fourth tergites, evanescent on tergites V and VI; lateral keels obsolete; tergite VII with a narrow apical membranous border; tergite X densely setose, narrowly rounded apically. Abdomen without evident microsculpture.

Legs short; posterior tarsi about $2/3$ the length of tibia (7:11); last segment slightly longer than first.

Male: femora not noticeably thickened. Sternite VIII with a very shallow excavation; aedeagus fig. 10.

Female: sternite VIII simply rounded apically; valvifer produced into an apicolateral point.

♂ Holotype, 2 ♀♀ Paratypes: River Kwae Noi, at Ban Soi Yok (N. 14° 27' E. 98° 51'), Kanchanaburi Prov., on sand and mud river bank, 3.III.1979, G. de Rougemont.

This very small new species may easily be separated from all other Oriental *Stenus* s. str. and *Nestus* species by using PUTHZ's new key (1980). From its closest relation, *S. beelsoni* Cam., it can be separated by the characters given in the key in this paper.

***Stenus* (*Hypostenus*) *puthzi* n. sp.**

This distinctive new species has no obvious close relations.

Length 5-6 mm. Elongate, with very long appendages.

Black, shining. Palpi testaceous, the apical half to two-thirds of segments infusate; antennae entirely black; legs pitchy black, with bases of femora lightened. Coarsely, sparsely and very irregularly punctate; the pubescence yellowish, short and coarse, and recumbant.

Head scarcely narrower than the maximum breadth of elytra (41:43); vertex broad (average distance between eyes: 24), deeply bisulcate, the median area as broad as those on either side, coarsely and irregularly punctate; the diameter of punctures is about equal to the diameter of the base of third antennal segment; interstices variable, from half to equal the diameter of punctures, with large irregular shiny impunctate areas on median and lateral portions. Pubescence of labrum fine, contrasting sharply with that of clypeus and of the rest of body; antennae long and slender; when reflexed, two terminal segments over-

lap the posterior margin of pronotum; antennal segments: I:7; II:4; III:14.5; IV:9; V:9.5; VI:5.5; VII:5; VIII:4; IX:5; X:4 (breadth: 3); XI:4.

Pronotum elongate (33:30), its maximum breadth about the middle, the sides narrowed in straight lines anteriorly, sinuate posteriorly. Punctuation coarse than that of head, close, nearly rugose near base and anterior margin, leaving irregular, bilaterally asymmetrical impunctate plaques on disc.

Elytra quadrate (length: 44; breadth: 43; length of suture: 35); all borders, and especially suture, strongly margined. Very coarsely and irregularly punctate (the largest punctures equal in diameter to the cross section of first antennal segment), with irregular, asymmetrical impunctate plaques on disc, and laterally, below humeral angles. Pubescence coarse, short and recumbant, mostly directed towards sides on disc, posteriorly on sides. The insect is macropterous.

Abdomen cylindrical, not narrowed before seventh segment; third tergite coarsely punctate in anterior transverse depression, more finely posteriorly; punctuation and pubescence of tergites IV-VIII fine and sparse; tergite VII with a terminal membranous fringe; tergite IX with a broad apical « comb »; tergite X shallowly depressed apically, slightly excavate; sternites shiny, sparsely punctate and pubescent (the pubescence is nearly always rubbed off on convex ventral surfaces, so that punctures appear glabrous); both sexes with a patch of dense pubescence on median apical portion of sternite VII; segments VII and VIII with distinct transverse micro-reticulation on dorsal and ventral surfaces.

Legs very long and slender: the apices of profemora reach the clypeus when extended forwards; length of hind legs, including tarsi: 163; metatarsi more than half the length of tibia (35:63); tarsal segments: I:16; II:7; III:5; IV:5; third segment broadened apically, and excavate dorsally, so that the fourth segment is inserted before the apex; fourth segment strongly bilobed on all tarsi, the lobes about two thirds the total length of segment.

Male: pubescent patch of sternite VII more extensive than in female; sternite VIII narrowly excised to about one eighth of its length (29:4); sternite IX with blunt denticulation; aedeagus (fig. 11A) flagellate, with parameres longer than median lobe.

Female: valvifer denticulate, without apico-lateral tooth.

♂ Holotype, 7 ♂♂, 11 ♀♀ Paratypes: Banks of River Mae Khong (Mekong) at Chiang Saen, in fine debris under bushes on mud river bank, 5.III.1979, G. de Rougemont; 3 ♂♂, 1 ♀ Paratypes: *ibid.*, 29.XII. 1979, G. de Rougemont.

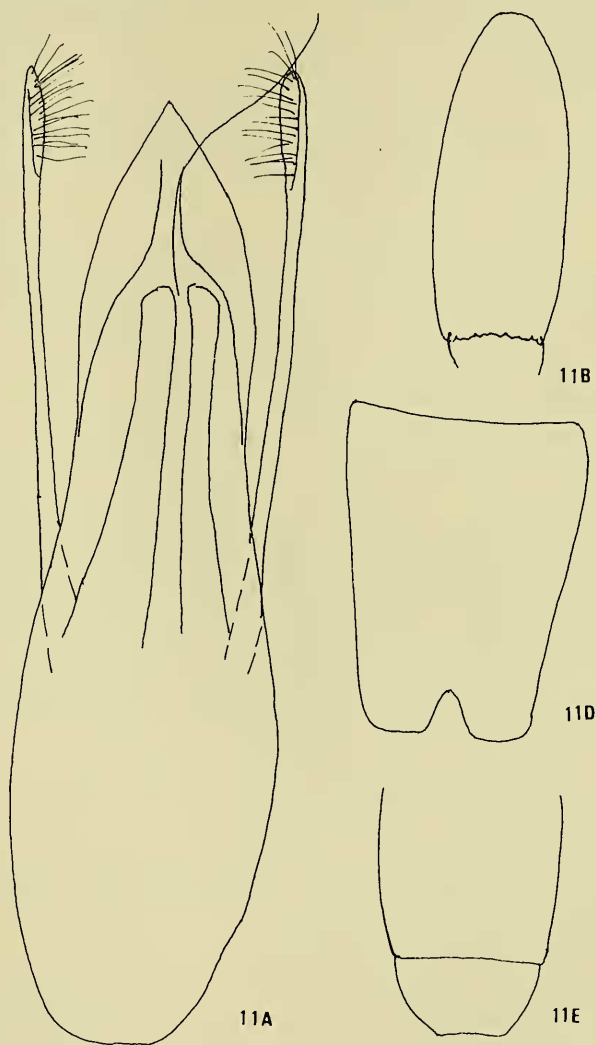


Fig. 11: *Stenus puthzianus* n. sp. - A: aedeagus; B: male 9th sternite; D: male 8th sternite; E: 9th and 10th tergites.

This new species does not resemble any other Oriental *Stenus* that I have seen, so a detailed comparison with other species is not necessary. In CAMERON's key (1930, p. 349) it runs to couplet 19, but differs from the two species therein by its entirely black antennae and dark legs. It should easily be distinguished from all other Oriental *Hypostenus* by the combination of colour, distinctive type of punctuation, and very long legs.

It is surprising that this species has so far gone unnoticed, for it is clearly not a montane species restricted in its range by altitude zones, or even, in view of its habitat, by narrow ecological requirements, and might be expected to occur over a long stretch of the Mekong river system, if not even further afield.

I have pleasure in dedicating this species to Dr. VOLKER PUTHZ, as a tribute to his prodigious contribution to the knowledge of Steninae.

***Stenus (Hypostenus) angusticollis* Epp.**

Stenus angusticollis Eppelsheim, 1895, Dtsch. Ent. Z., 405.

Stenus angusticollis Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 371.

Stenus angusticollis Puthz, 1976, Dtsch. Ent. Z., N.F. 23, 4.

Stenus (Hypostenus) angusticollis Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 334.

1 ♀: Wang Takrai Park, Nakhon Nayok Prov., 4-7.IX.1978, J. Bremer; 1 ♀: Doi Suthep, Chiang Mai Prov., 900 m, in vegetable refuse by a torrent in primary forest, 6.III.1979, G. de Rougemont; 1 ♂: Mae Klang Waterfall, Doi Inthanon, Chiang Mai Prov., under dead leaves on sandy bank, 26.XII.1979, G. de Rougemont.

This species was described from Pegu in lower Burma, but is also known from Assam, N. India, and Nepal.

***Stenus (Hypostenus) amoenus* L. Bck.**

Stenus amoenus L. Benick, 1916, Ent. Mitt., 5, 249.

Stenus rufoplagiatus Champion, 1924, Ent. Mon. Mag., 40, 160.

Stenus rufoplagiatus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 355.

Stenus amoenus L. Benick, 1942, Stett. Ent. Z., 103, 67.

Stenus amoenus Puthz, 1968, Not. Ent., 48, 98.

Stenus (Hypostenus) amoenus Rougemont, 1981, Ann. Mus. Civ. St. nat. Genova, 83, 333.

1 ♂: Chiang Saen, on mud bank of Mae Khong River, 5.III.1979, G. de Rougemont.

Known from many areas of S. Asia, but see remarks concerning following spp.

Stenus (Hypostenus) alumoenus n. sp.

This new species is closely allied to *S. amoenus* L. Bck. and to several other new species recognised by PUTHZ (in litt.) from Vietnam, and a comparison with its closest relations is sufficient to describe it.

Length: 4.5-5 mm. Black, fairly shiny, coarsely and moderately densely punctate. Each elytron with a large, but variable, orange spot covering most of the disc in posterior 2/3rds. Palpi, antennae and legs testaceous, the antennae gradually infusate towards apices.

Proportions of Holotype: breadth of head: 36; average distance between eyes: 11; distance between humeral angles: 32; maximum breadth of elytra: 39; maximum length of elytra: 40; length of pronotum: 30; breadth of pronotum: 26.

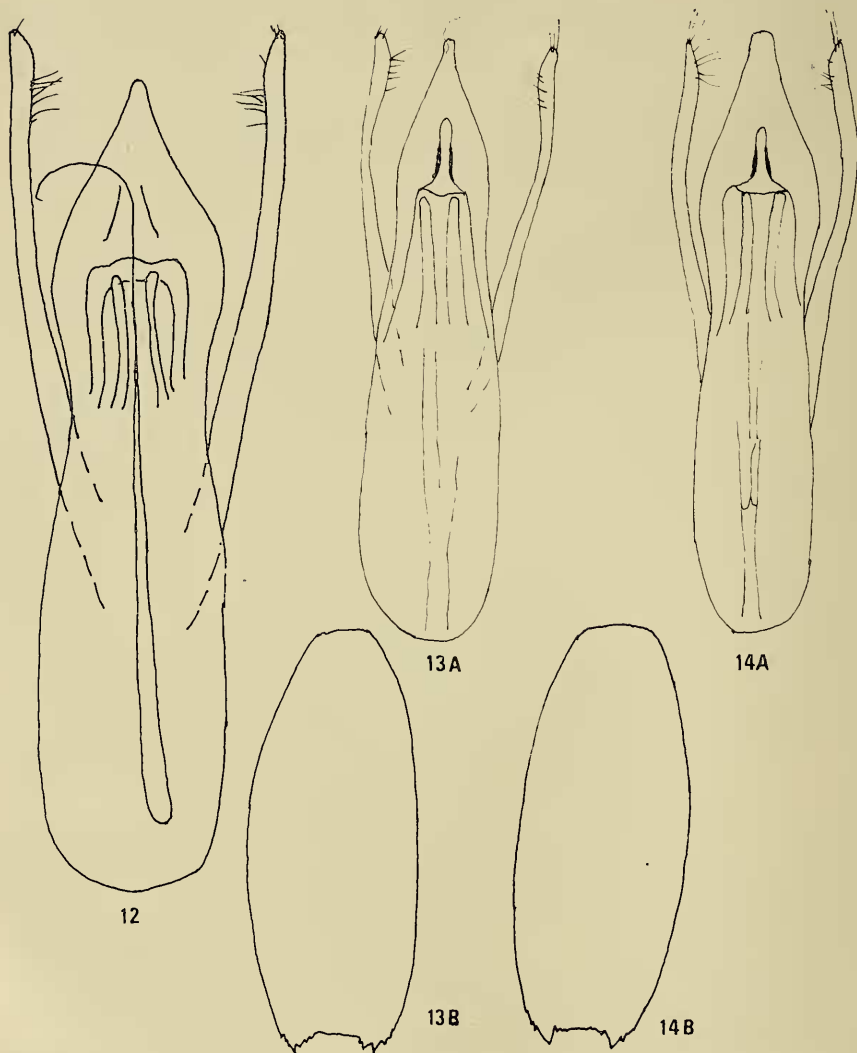
Male: sternite IV with a shiny apico-median patch, the space of about 5 missing punctures; sternite V with a broad median flattened area extending to over half the length of sternite, slightly depressed apically, this area covered with very fine punctuation, and longer pubescence; sternite VI with a similar micropunctate area, but extending to the base of sternite, and concavely depressed in apical half, where pubescence forms a yellowish tuft, the micropunctuation of this part becoming slightly rasp-like; sternite VII with a median patch of rasp-like micropunctuation, similar to but more pronounced than that of the apical, depressed portion of sternite VI; sternite VIII with median micropunctuation coarser and sparser than on preceding segment; sternite IX (fig. 13B) without a distinct apico-lateral tooth, but finely denticulate around apico-lateral angles; aedeagus (fig. 13A) with narrow and relatively strongly acuminate apex of median lobe.

Female: valvifers finely denticulate over entire apex and apico-lateral angles, without a distinct, single apico-lateral tooth.

S. amoenus L. Bck., considered until now to be a single, variable species, appears to be a complex of very closely allied species, of which *S. alumoenus* n. sp. is one. PUTHZ (in litt.) recognises several more from recently studied material from Vietnam; the name *alumoenus* is an anagram of one PUTHZ's new species, which appears to be its closest relation, and a detailed comparison with this, and with *S. amoenus* L. Bck. is given below.

♂ Holotype, 10 ♂♂, 15 ♀♀ Paratypes: Wang Takrai Park, Nakhon Nayok Prov., near grasses, on rocks and mud bank in a shaded river bed, 31.III.1980, G. de Rougemont.

S. alumoenus n. sp. can be distinguished without difficulty from *S. amoenus* L. Bck. by its smaller size and proportionately finer punctuation, and the aedeagus (figs. 13A) which is smaller, and narrower at the broadest part of the apical half of the median lobe. From PUTHZ's



Figs. 12: *Stenus amoenus* L. Bck. from Chiang Saen, aedeagus; 13: *Stenus alumoenus* n. sp. - A: aedeagus; B: male 9th sternite; 14: *Stenus* n. sp. Puthz (in litt.) from Vietnam - A: aedeagus; B: male 9th sternite.

new species, to which it is identical in size and build, it differs by its slightly finer punctuation, less extensive impunctate area of frons, and by the male sex characters: the micropunctate and pubescent areas of abdominal sternite V, VI and the anterior half of VII are impunctate and glabrous in PUTHZ's species, which also possesses a distinct larger apico-lateral tooth on the 9th sternite, without distinct lateral denticulation, whereas the entire apico-lateral angle is more evenly denticulate in *S. alumoenus* n. sp. The aedeagus is similar in size and outline in both species, but the apex of the median lobe is less acuminate, blunter, n PUT HZ's species.

Stenus (Hypostenus) spp. cf. *amoenus* L. Bck.

1 ♀: Suai River, Chiang Rai Prov., at roots of grasses on gravel bed of a stream in jungle, 6.III.1979, G. de Rougemont; 1 ♀: Keng So Pa Cascades on River Khek, Phitsanulok Prov., at roots of low plants at edge of river, 23.XII.1980, G. de Rougemont.

These two exx. were thought to belong to *S. amoenus* L. Bck., the presence of which in Thailand is now confirmed by the male listed above, but differ from that, and from other typical exx. in several respects, so that in view of the recent discoveries of other closely related species, they must remain undetermined until the discovery of more material. These two exx. clearly belong to different taxa, showing very different degrees of punctuation.

Stenus (Hypostenus) *pustulatus* Bernh.

Stenus pustulatus Bernhauer, 1914, W.Z.B., 64, 95.

Stenus pustulatus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 354.

Stenus pustulatus Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 333.

3 ♂♂: River Suai, Chiang Rai Prov., by stream in jungle, 6.III.1979, G. de Rougemont; 7 ♂♂, 7 ♀♀: Keng So Pa Cascades on R. Khek, Phitsanulok Prov., at roots of low-growing plants on river bank, 23.XII.1979; 9 ♂♂, 13 ♀♀: Banks of R. Yom at Sri Satchanalai, Phitsanulok Prov., in vegetable refuse on mud bank, 24.XII.1979, G. de Rougemont; 1 ♀: Wang Takrai Park, Nakhon Nayok Prov., 4-7.IX.1978, J. Bremer; 17 ♂♂, 5 ♀♀: *ibid.*, in vegetable refuse on stream bed, 31.III.1980, G. de Rougemont; 1 ♂: River Kwae Noi, at Ban Soi Yok, Kanchanaburi Prov., in vegetable refuse on mud river bank, 3.III.1979, G. de Rougemont.

This species was described from Pegu, and recently found again in Rangoon by the author, who described the male. The new records show that it is common and very widespread in the lowland areas of Thailand.

Stenus (Hypostenus) pulchrior Puthz

Stenus pulchrior Puthz, 1971, Mitt. Zool. Mus. Berl., 47, 47 ff.

2 ♂♂: Mae Sa Cascades, Chiang Mai Prov., running on mud banks of 2 separate, heavily shaded tributary streams, in primary forest, 19.X.1979, G. de Rougemont.

This species was described from Calcutta, and was named to indicate its similarity to *S. pulcher* Mots. The species runs very quickly over open surfaces when disturbed, giving it an additional resemblance to *Paederus* spp. This same behaviour, and a similar habitat near heavily shaded streams in thick forest, has been observed in another bicolorous species of the *pulcher* group, *S. frater* L. Bck. These observations, and the distribution of the group, suggest that they are relicts in areas of ancient forests.

Stenus flavidulus paederinus Champ.

Hypostenus paederinus Champion, 1924, E.M.M., IX, 160.

Stenus pictus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I,

Stenus flavidulus paederinus, Scheerpeltz 1967, Dt. ent. Z., 14, 143.

1 ♂: Campoon, N. Thailand, 21.XII.1962, S. Nakao and A. Nagatomi (in coll. Last).

This record comes from a private communication from PUTHZ. The species was previously known from Northern India.

Stenus (Hypostenus) fulviventris n. sp.

This new species shows an unusual bicolorous pattern similar to that of *S. fulvescens* Mots.

Length: 5.4-5.6 mm.

Median area of vertex, lateral portions of pronotum, humeral angles (narrowly), and entire ventral surface, excepting abdominal segments VII-IX fulvous, this colour also extending to lateral parts of tergites III-VI; most of dorsal surface, i.e. lateral areas of vertex,

discs of pronotum and elytra, abdominal tergites II-VI, and entire segments VII-X pitchy brown. Clypeus, palpi, antennae and legs testaceous, the antennae progressively infusate; knees and dorsal surfaces of tarsal segments I-III very slightly darkened. Coarsely and densely punctate, the whitish pubescence short.

Head much broader than elytra between humeral angles (42:35), about as broad as the latter at their widest point; vertex broad (average distance between (large) eyes: 20), the narrowly impunctate median area (the space of 2-3 missing punctures) scarcely raised, and without lateral sulci. Punctuation coarse, the diameter of average punctures exceeding that of third antennal segment, and somewhat irregular; the interstices vary on lateral areas from $1/2$ to $1/1$ the diameter of punctures. Antennae long, overlapping the posterior margin of pronotum by 2-3 terminal segments; antennal segments: I:6; II:4; III:11; IV:9; V:9; VI:7; VII:5; VIII:5; IX:5; X:5 (diameter: 2); XI:6.

Pronotum elongate (33:30), its widest point about the middle; surface fairly even, the punctuation slightly coarser than that of head, rugose, the punctures deep, and the shiny interstices less than half the diameter of punctures.

Elytra widened from humeral angles (35) to a little beyond the middle (43), slightly transverse (greatest length: 43; length of suture: 30). Punctuation marginally coarser than that of pronotum, the diameter of punctures equal to that of third antennal segment, rugose and regular.

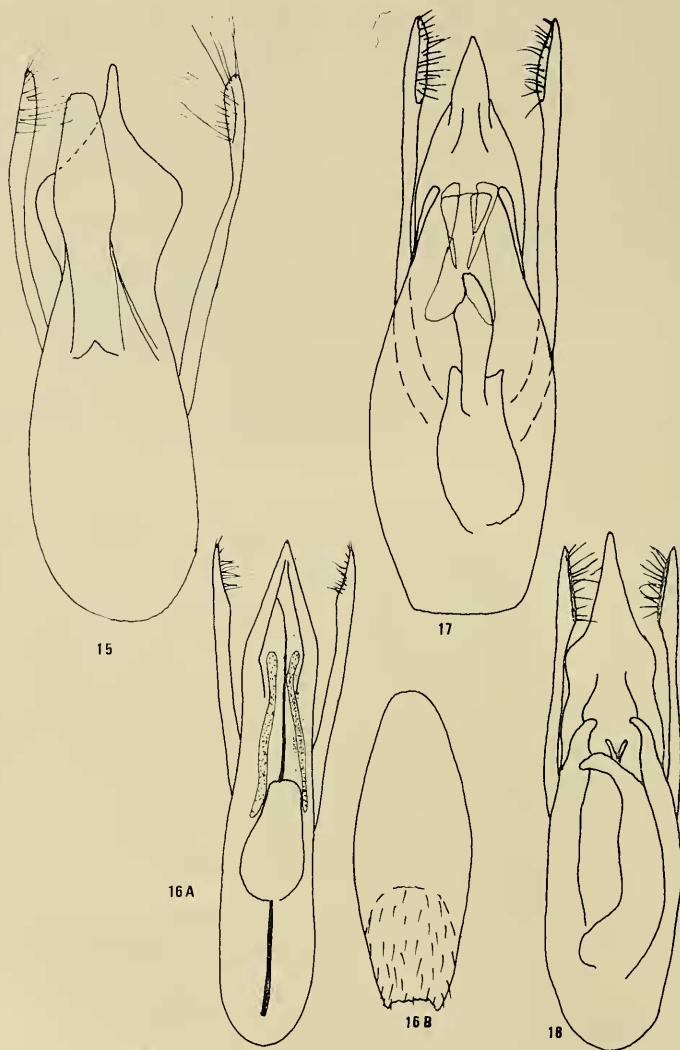
Abdomen cylindrical, coarsely but more sparsely punctate, the punctures about the size of those on vertex on tergites III-VI, becoming progressively finer on tergites VII-VIII. Pubescence longer, coarse, and more obvious than on fore-body. Tergite VII with a membranous apical fringe; tergite IX impunctate, shiny, with a deep terminal « palissade » fringe; tergite X with a few irregular shallow punctures, and a dense apical fringe of pubescence, the surface uneven, the apex evenly rounded and depressed.

Legs fairly stout; length of metatibia: 41; length of metatarsi: 23; 1st tarsal segment as long as the 3 following together.

Male: metafemora slightly thickened? (♀ not available for comparison); sternites IV-VI with apico-median depressions covered in dense micro-punctuation and pubescence; sternite VII flattened, but not micro-punctate; sternite VIII with a deep, narrow excision; sternite IX: fig. 15B; aedeagus: fig. 15A.

Female: unknown.

♂ Holotype, 2 ♂♂ Paratypes: Mae Klang Waterfall, Doi Inthanon, Chiang Mai Prov., under light covering of dry dead leaves on sandy river bank, 26.XII.1979, G. de Rougemont.



Figs. 15: *Stenus pulchrior* Puthz, outline of aedeagus; 16: *Stenus fulviventrīs* n. sp. - A: aedeagus; B: male 9th sternite; 17: *Stenus bispinus* Mots., aedeagus; 18: *Stenus* n. sp. Puthz (in litt.) from Tenasserim, aedeagus.

It seemed possible at the first analysis that this new species would prove to be conspecific with *S. fulvescens* Mots., described from a single female from « Ind. Or. ».

However, sufficient differences exist between these specimens and the short diagnosis given by CAMERON (1930, p. 352) to justify its name: *S. fulvescens* is said to be entirely reddish-testaceous, except the two terminal abdominal segments, (but pygidium testaceous!), with humeral angles lighter. The difference in colour might be due to immaturity or discolouration of MOTSCHOUISKY's insects, except the contrasting colour of the 10th tergite. The punctuation is described as being not very close (subject to interpretation), the third antennal segment is « almost twice as long as the 4th », and the pygidium is emarginate at the apex in *S. fulvescens*, none of which characters agree with the diagnosis of *S. fulviventrīs* n. sp.

***Stenus (Hypostenus) piliferus* Mots.**

Stenus piliferus Motschoulsky, 1857, Bull. Mosc. 30, 515.

Stenus piliferus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 378.

Stenus piliferus Puthz, 1978, Ann. Hist. nat. Mus. Nat. Hung., 70, 128.

1 ♀: Mae Sa Cascades, Chiang Mai Prov., at roots of grass on river bank, 19.X.1979, G. de Rougemont.

Males of this species must be collected in Thailand before the exact status of this ex. can be established, for *S. piliferus* is a polytypic species, the members of which vary considerably, especially in their punctuation. They are known from a wide range in South Asia, with several subspecies described from islands of the Malay Archipelago.

***Stenus (Hypostenus) bispinus* Mots.**

Stenus bispinus Motschoulsky, 1857, Bull. Mosc. XXX, IV, 514.

Stenus bispinus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 364.

1 ♂, 2 ♀♀: Chiang Saen, under shrubs on mud banks of Mae Khong River, 5.III.1979, G. de Rougemont; 2 ♀♀: Wang Takrai Park, Nakhon Nayok Prov., 4-7.IX.1978, J. Bremer.

PUTHZ, who is preparing a work on the subject, has informed me privately that the material attributed to this species in fact belong to a complex of distinct species, virtually indistinguishable from each other on external characters, but with very different aedeagi. The male listed above agrees with the types of *S. bispinus* Mots., and it is supposed

that the females from Wang Takrai Park also belong to this species. The aedeagus of one of PUTHZ's new species (in litt.) is also figured, as this form, from Tenasserim, almost certainly occurs in Thailand. The range for the species-complex as a whole is fairly vast in S. Asia, and it now remains to define the distribution of PUTHZ's new species as well as that of the true *S. bispinus* Mots.

***Stenus* (*Hypostenus*) *wasmanni* Fv.**

Stenus wasmanni Fauvel, 1895, Rev. d'Ent. XIV, 214.

Stenus wasmanni Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 376.

Stenus wasmanni Puthz, 1975, Ent. Basil., 1, 189.

Stenus wasmanni Puthz, 1969, Bull. Inst. r. Sci. nat. Belg., 45, 9, 31.

Stenus wasmanni Rougemont, 1980, Ent. Basil, 5, 181.

Stenus wasmanni Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 337.

1 ♀: Doi Suthep, Chiang Mai Prov., alt. 900 m, in vegetable refuse by a small stream, in primary forest, 25.XII.1979, G. de Rougemont.

This is a montane species, first described from Burma, but since recorded from a vast Himalayan range.

***Stenus* (*Hypostenus*) *cursorius* L. Bck.**

Stenus planifrons Fauvel, 1889, Rev. d'Ent., VIII, 253.

Stenus cursorius L. Benick, 1921 (nom. nov.), Ent. Mitt. 10, 193.

Stenus planifrons Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 382.

Stenus cursorius Puthz, 1969, Bull. Inst. r. Sci. nat. Belg., 45, 9, 26.

Stenus cursorius Puthz, 1976, Dtsch. ent. Z., N.F. 23, 4.

Stenus cursorius Rougemont, 1980, Ent. Basil, 5, 182.

Stenus cursorius Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 338.

8 ♂♂, 10 ♀♀: River Kwae Noi at Ban Soi Yok, Kanchanaburi Prov., on mud river bank, 3.III.1979, G. de Rougemont.

This is one of the most widely distributed Asian species, but has only been found in this one locality in Thailand.

***Stenus* (*Parastenus*) *articulipennis* n. sp.**

This new species is by definition a *Tesnus* Rey (abdomen unmarginated, tarsi simple), but is here described as belonging to the subgenus *Parastenus* for the phylogenetic reasons discussed below. It is closely related to *S. kempi* Bnh. and to *S. perplexus* Puthz, described from Borneo.

Length: 3.6-3.9 mm. Fully winged.

Black, shining, coarsely and rugosely punctate, with fine, short pubescence. Anterior margin of clypeus brown; all appendages testaceous, with antennal club and knees (narrowly) infusate.

Head broader than elytra at humeral angles (33:29), scarcely narrower than these at their broadest point; frons broad (average distance between eyes: 19) with two shallow longitudinal depressions on either side of the slightly raised median axis. Punctuation coarse, the diameter of punctures slightly larger than the (globular) eighth antennal segment, smaller than the greatest breadth of second segment, and irregular, leaving shiny impunctate areas on median axis and laterally. Antennae short, when reflexed not extending to the posterior margin of pronotum, the fourth segment three quarters the length of third, the penultimate segments quadrate.

Pronotum slightly transverse (21:24), its greatest breadth before the middle, slightly sinuate posteriorly. Surface uneven, with a pronounced median furrow. Punctuation very coarse and rugose, the diameter of punctures equal to that of the second antennal segment.

Elytra transverse; greatest breadth (one third from posterior margin): 35; greatest length: 29; length of suture: 20, with prominent humeral angles, the surface uneven, with shallow juxtasutural depressions, and anterior bosse on each elytron about equidistant from the suture and the humeral angle. Punctuation comparable to that of pronotum. Abdomen broadly elliptical in section, only very slightly narrowed towards apex: breadth of segment III: 24; segment VI: 23; segment VII: 19; tergite VII with a membranous apical fringe. Punctuation coarse on tergites III-IV, about as coarse and dense as that of head, but more regular, and becoming progressively finer, shallower, and slightly elongate towards apex. Tergite X with six or seven shallow setigerous punctures on upper surface, broadly rounded and with a dense fringe of pubescence apically, and a narrow apico-median depression.

Legs robust, the metatarsi three quarters the length of metatibia, the first tarsal segment longer than the two following together; fourth tarsal segments simple.

Male: femora slightly thickened; mesotibia a little compressed apically, and with a concolorous apical tooth on the inner margin;

metatibia with a concolorous preapical tooth. Abdominal sternites III-V without special characters; sternites VI-VII with progressively finer and more elongate punctuation on median portions, the sixth sternite with a very shallow, short median emargination; sternite VIII with a triangular apical excision to one sixth of its length; sternite IX (fig. 19B) with sharp apico-lateral angles turned upwards. Aedeagus (fig. 19A) with median lobe broad, terminated in a long acute apex; the exosclerite of the median lobe is divided into two parts one third from apex, the two sections appearing to be held together only by the hinge formed by the inner structures; the ventral surface of apical portion of median lobe with a large deep fovea (better seen in reflected light - three dimensional view), and a strongly sclerotised expulsion clasp, of characteristic shape, is visible between the two articulated portions of the median lobe.

Female: valvifers with a strong upturned apico-lateral point, equivalent to those of the male ninth sternite.

♀ Holotype, 1 ♂ Paratype: Mae Sa Cascades, Chiang Mai Prov., under dead leaves on dry rock surface in torrent, 27.XII.1979, G. de Rougemont; 1 ♀ Paratype: Mae Klang Waterfall, Doi Inthanon, Chiang Mai Prov., under dry leaves on rock and sand river bank, 26.XII.1979, G. de Rougemont.

This new species belongs to a small group of Oriental *Stenus* species which includes *S. kempi* Bnh., also found in Thailand, *S. perplexus* Puthz from Borneo, *S. sulcipennis* Bnh. and *S. iniquus* L. Bck.

Two characters used to separate major groups of *Stenus* spp., the conformation of the fourth tarsal joints, and the presence of an abdominal margin, appear to be quite unstable within this phyletic group. Thus while *S. kempi*, with its fairly strongly bordered abdomen and bilobed tarsi, is readily recognisable as a *Parastenus*, this new species and *S. perplexus* are, by definition, *Tesnus* spp., and a further two species *S. iniquus* and *S. sulcipennis*, with bilobed tarsi but lacking an abdominal margin, were described as *Hypostenus* spp. PUTHZ, in a personal communication, pointed out the true phylogenetic status of this group, which is obvious (at least in the three species examined by me: *S. perplexus*, *S. kempi* and the new species) not only from the primary and secondary sex characters, but also by the close similarity of general habitus and punctuation.

The female from Doi Inthanon shows a faint vestige of an abdominal margin; because this character is so variable among otherwise

closely related species, I consider it probable that it may also be so within the species, and although this specimen has not been designated a Paratype, I have no hesitation in attributing it to the new species.

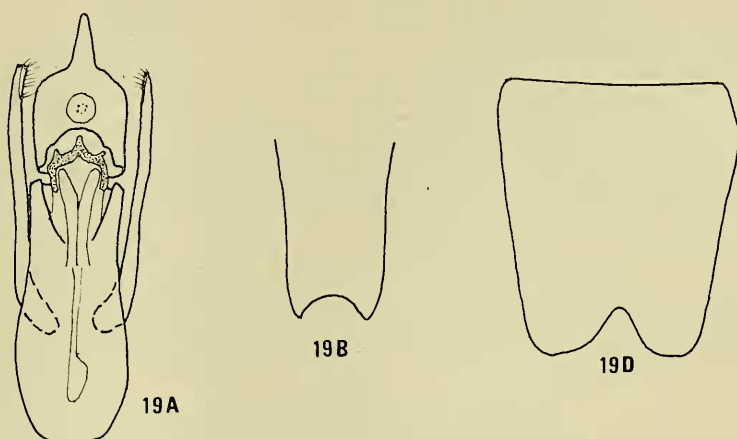


Fig. 19: *Stenus articulipenis* n. sp. - A: aedeagus, ventral view; B: male 9th sternite; D: male 8th sternite.

S. articulipenis n. sp. shares with *S. perplexus* Puthz and *S. kemp* Bnh. the same male secondary characters, the same build and puncturation, only differing in minor proportions, and the presence of a particular form of heavily sclerotised expulsion clasp of the penis (stippled in the drawing), which varies in shape in each species. It differs from all known Steninae by the extraordinary «articulated» structure of the median lobe.

The male paratype was found to be lacking an aedeagus; possibly this was torn off while extruded, or during copulation, before capture.

***Stenus* (*Parastenus*) *kemp* Brnh.**

Stenus kemp Bernhauer, 1926, Ent. Mitt. XV, 132.

Stenus kemp Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 401.

1 ♂, 2 ♀♀: Sakaerat Experimental Station, VIII.1970, H. Franz.

This species was described from an ex. taken under bark in N. India. The exx. above communicated to me by PUTHZ, are from sifting or funnel samples.

Besides the characters given in the key, it can be distinguished from *S. articulipennis* n. sp. which it otherwise closely resembles, by its smaller head and narrower frons.

***Stenus (Parastenus) cf. meracus* L. Bck.**

Stenus meracus L. Benick, 1942, Ark. Zool. 33A, 17, 32.

1 ♀: Doi Suthep, Chiang Mai Prov., alt. 900 m, in vegetable refuse in torrent, in primary forest, 6.III.1979, G. de Rougemont.

Dr. PUTHZ was able to compare this insect with a female *S. meracus*, described from Kachin State of N.E. Burma, but the male would be necessary to establish its identity with certainty. The species, with immaculate elytra and narrowly bordered abdomen superficially resembles the last two species, but the male secondary characters, described by BENICK, show that it belongs to a different phyletic group.

***Stenus (Parastenus) feae* Fv.**

Stenus feae Fauvel, 1895, Rev. d'Ent. XIV, 211.

Stenus feae Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 388.

Stenus feae Puthz, 1969, Bull. Inst. r. Sci. nat. Belg., 45, 9, 34.

Stenus feae Puthz, 1981, Ent. Bl. Biol. Syst. Kaefer, 76, 142.

Stenus feae Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 346.

1 ♀: Doi Suthep, Chiang Mai Prov., alt. 900 m, in wet vegetable refuse in a torrent, in primary forest, 6.III.1979, G. de Rougemont.

This species, remarkable even among the other narrow bordered, spotted Parasteni for its enormous eyes, was first taken in the Karen Hills of Burma, and also recorded from Tharawaddy and Taunggyi.

***Stenus (Parastenus) circumflexus* Fv.**

Stenus circumflexus Fauvel, 1895, Rev. d'Ent. XIV, 211.

Stenus circumflexus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 386.

Stenus circumflexus Puthz, 1969, Bull. Inst. r. Sci. nat. Belg., 45, 9, 33.

Stenus circumflexus Puthz, 1981, Ent. Bl. Biol. Syst. Kaefer, 76, 146.

Stenus circumflexus Rougemont, 1981, Ann. Mus. Civ. St. Nat. Genova, 83, 343.

6 ♂♂, 2 ♀♀: Doi Suthep, Chiang Mai Prov., alt. 900 m, by splashing a heap of wet muddy twigs and leaves by a stream in dense forest, 25.XII.1979, G. de Rougemont.

S. circumflexus was until now only known from Burma: Karen Hills (Fea) and the central Shan Plateau (Rougemont).

***Stenus (Parastenus) gestroi grandiculus* L. Bck.**

Stenus grandiculus L. Benick, 1926, Ent. Mitt. XV, 277.

Stenus grandiculus Cameron, 1930, Faun. Brit. Ind., Col. Staph. I, 385.

Stenus gestroi grandiculus Puthz, 1981, Ent. Bl. Biol. Syst. Kaefer, 76, 154.

1 ♀: Doi Suthep, Chiang Mai Prov., under a stone on wet vegetable refuse on clay bank of stream, in primary forest, 25.XII.1979, G. de Rougemont.

This taxon is known from Burma and Yunan. Its closest relations, considered by PUTHZ to be subspecies of *S. gestroi* range from the United Provinces of India through Assam and Burma to the Philippines and the Sunda Islands.

COMPOSITION OF THE STENINE FAUNA OF THAILAND

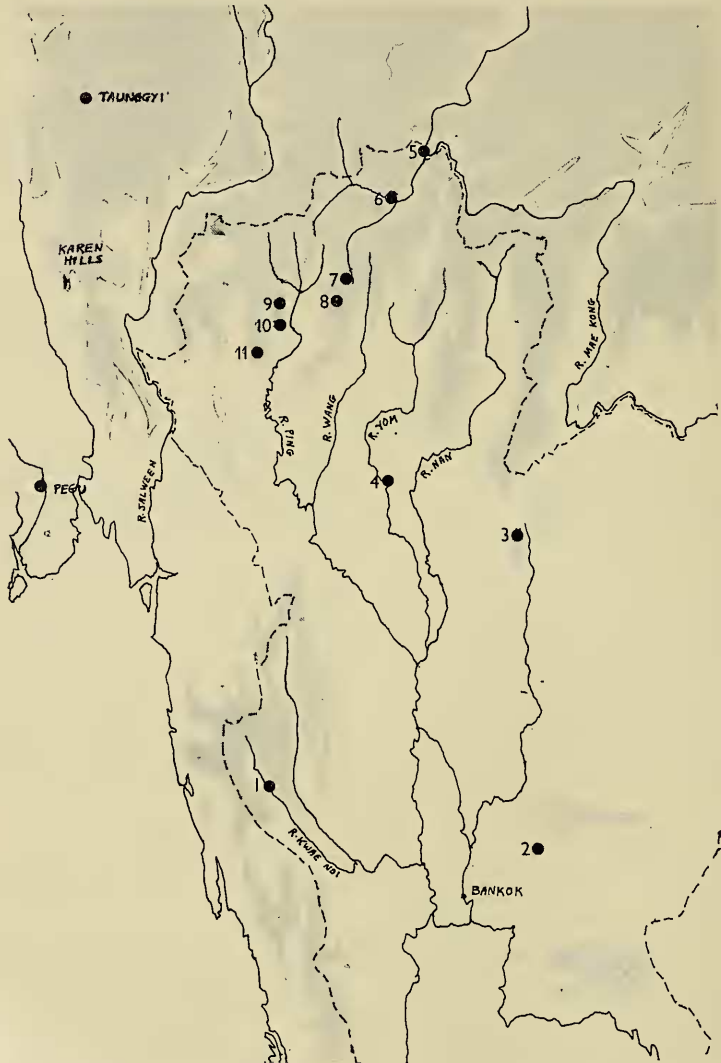
The material at present known from Thailand falls, with the exception of a few unknown elements, into two distinct faunal associations: Highland and Lowland.

The Lowland species include all but one of the thirteen *Hypostenus* taxa, and tend to be widespread in Thailand, most of them also occurring in similar habitats in other parts of S. Asia, and especially in Burma. Some of them also penetrate the montane habitats, but are then found in small numbers or as isolated individuals, presumably because they are here in competition with a greater number of different species, whereas they are often found in very large colonies in the lowland areas (e.g. *S. pustulatus* Bernh.).

It is as yet unclear to which of these two faunas four of the species of *Stenus* s. str. & *Nestus* found in Thailand should be attributed as a group; *S. beesonii* Cam. is only known from montane localities over a wide S. Asian range, but the other three species have also been found in lowland areas. To these uncertain elements must for the present be added two *Parastenus* species, *S. kempi* Bnh. and *S. articulipenis* n. sp., about which too little is known.

The Montane areas of Thailand are concentrated in the North where the Thanen-Taunggyi range, and those of Laos and Tonkin, constitute the terminal projections of a vast uninterrupted range extending from the Himalaya through Assam and Burma. The Stenine fauna of this area is particularly interesting, and includes the seven species of *Dianous*, three spotted *Parastenus* spp., *Stenus (Parastenus) meraculus* L. Bck., *Stenus* (s. str.) *comes* Fv. and *Stenus (Hypostenus) wasmanni*

Fv. These represent, at a guess, less than half of the montane species occurring in N. Thailand. One *Dianous* and all the *Stenus* spp. were described from nearby localities in Burma (see map); two *Dianous* are conspecific with ones recently described by PUTHZ from important



Map of Central and North-East Thailand, showing localities listed in this paper. Shaded areas represent land above 600 m. 1: Band Soi Yok; 2: Wang Takrai Park; 3: Keng So Pa Cascades; 4: Sri Satchanalai; 5: Chiang Saen; 6: Chieng Rai; 7: Suai River; 8: Kwang River; 9: Mae Sa Cascades; 10: Doi Suthep; 11: Doi Inthanon.

collections made in North Vietnam by G. Kabakov and others (in Mus. Leningrad), three *Dianous* are so far known only from Thailand, and one widely distributed in Indochina and the Sunda Islands. Only one species (*S. wasmanni* Fv.) is « Greater Himalayan » in distribution, being found in Nepal, Assam, etc.

The three spotted *Parastenus* spp. all belong to a group characterised by exceptionally large eyes, narrowly bordered, cylindrical abdomen, and much wetter humicolous habitats than the wide bordered species. It is practically certain, judging from the group's known distribution, that many of the wide-bordered species will be found in Thailand when suitable habitats are searched.

Two major regions, of Thailand, not shown in the map, remain unexplored for Steninae. The Eastern plateau, a relatively arid land similar to large parts of neighbouring Cambodia, and the tropical rain forests of Peninsular Thailand, where the fauna may be expected to be analogous to that (as yet little known) of Malaysia.

It is hoped to supplement this paper with another publication if future trips to Thailand add much material of interest to the present data.

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ABSTRACT

No Steninae have so far been recorded from Thailand, but the present knowledge of the faunas of some neighbouring countries suggested that the fauna of Thailand must be very rich, and has prompted the author, in the course of short trips in the space of one year to make a special search for these insects. Over thirty species were collected, which form the basis of this preliminary work. Taxonomic innovations include the descriptions of nine new species and the recognition as new of three other taxa which are not named. A short key to the species at present known from Thailand is given, the faunal composition of the material is briefly discussed, and field observations recorded. Illustrated with figures and one map.

RÉSUMÉ

LES COLEOPTERES DE LA THAILANDE.

La sousfamille Steninae, comprenant seulement deux genres (*Stenus* Lat., avec plus de 1600 espèces connues, et *Dianous* Leach, avec quelques 100 espèces) est répandue dans toutes les grandes régions du globe, et paraît être particulièrement riche en espèces dans les grandes chaînes montagneuses qui prolongent l'Himalaya jusqu'en Indochine, mais aucune espèce n'avait été signalée à ce jour de la Thaïlande. L'auteur a récemment recolté plus de trente espèces de ce groupe dans ce pays, et ce matériel forme la base du présent travail. Neuf espèces nouvelles y sont décrites, et trois autres reconnues comme nouvelles sans être nommées. La composition de cette faune et les nombreuses observations faites sur le terrain sont brièvement discutées, et il y est donné un tableau des espèces actuellement connues de la Thaïlande. Illustré de figures et d'une carte.